

**STATE OF CALIFORNIA**

**AIR RESOURCES BOARD**

**Proposed Amendments to the Evaporative )  
Emission Requirements for Small Off-Road )  
Engines )**

**Hearing Date:  
November 17, 2016**

**COMMENTS OF THE  
TRUCK AND ENGINE MANUFACTURERS ASSOCIATION**

**November 17, 2016**

**Roger T. Gault  
Jed R. Mandel  
Truck and Engine Manufacturers Association  
333 West Wacker Drive, Suite 810  
Chicago, Illinois 60606**

**STATE OF CALIFORNIA**  
**AIR RESOURCES BOARD**

**Proposed Amendments to the Evaporative )  
Emission Requirements for Small Off-Road )  
Engines )**

**Hearing Date:  
November 17, 2016**

**COMMENTS OF THE  
TRUCK AND ENGINE MANUFACTURERS ASSOCIATION**

The Truck and Engine Manufacturers Association (“EMA”) hereby submits its comments on the California Air Resources Board’s (“CARB’s”) Proposed Amendments to the Evaporative Emission Requirements for Small Off-Road Engines (“the SSI Evaporative Regulation Amendments”).

EMA is the trade association that represents the world’s leading manufacturers of non-handheld small spark-ignition engines. More specifically, EMA’s members are the manufacturers of the engines that CARB regulates directly, or indirectly through their equipment manufacturer customers under the SSI Evaporative Regulation for engines greater than 80 cc. Accordingly, EMA and its members have a direct and significant stake in the regulatory proposal at issue. EMA strongly supports the comments provided by the Outdoor Power Equipment Institute (OPEI) for engines less than or equal to 80 cc not included in EMA’s comments, and OPEI comments for engines greater than 80 cc that are covered by both organizations.

**I. Overview**

EMA supports CARB’s objective to align the test fuel utilized for evaporative compliance with the test fuel utilized for exhaust emission compliance. That said, the majority of the changes being proposed under the SSI Evaporative Regulation Amendments are ill-conceived attempts to improve compliance that are poorly timed given CARB stated intention to change the SSI exhaust and evaporative emission standard requirements in a rulemaking activity proposed to take place in 2018, prior to the changed proposed becoming effective. Many of the changes proposed will shift manufacturers’ R&D focus away from the development of products meeting these future regulatory requirements to develop products that meet the proposed regulation changes.

**II. Proposed Regulation Amendments**

The proposed SSI Evaporative Regulation Amendments include three major categories of changes: (i) change of the certification test fuel to E10; (ii) changes to the certification process (and related test methods) used to demonstrate compliance; and (iii) changes to the CARB compliance determination and related enforcement activity. EMA member companies have significant concerns with all three of the three major categories.

A. Change to E10 certification test fuel:

Conceptually EMA member companies strongly support the change in certification test fuel beginning in the 2020 model year as proposed. The timing for this change aligns with the corresponding change in exhaust emission certification test fuel for California products, and also provides the potential to use the same certification test fuel for CARB and EPA testing requirements.

However, there is significant standard stringency impact associated with the test fuel change. In the Initial Statement of Reasons the CARB Staff reports test results suggesting that passing units will remain passing units. However, a review of the CARB test data shows an average increase of over 18% with a range from a negative 10.5% to a positive 47.5% excluding one unit that was apparently repaired between the two tests that showed a 69% improvement. In addition there are significant concerns with the test-to-test repeatability. Again analysis of CARB's test data for three tests of a single unit shows significant increases in failure, or statistical potential for failure without consideration of any engine/equipment to engine/equipment variability. To further skew the data set utilized by CARB Staff, a significant portion of the units tested using the E10 test fuel were selected based on their having passed when tested using the current certification test fuel. CARB Staff claims on one-hand that significant changes are required to improve compliance, and on the other-hand significant increases in emission rates associated with the change in test fuel are not problematic. EMA members recommend the applicable permeation and diurnal emission limits be increased 20% to adjust the standard stringency for the test fuel change.

B. Certification Process (and related test methods)

The SSI Evaporative Regulation Amendments claim to make changes to the certification and related test methods to improve compliance with the diurnal emission standards. However, there is no supporting information, and in some cases counter information used to justify the proposed changes. One fundamental assumption made by staff is that the compliance rate will improve compliance by requiring directly, or indirectly compliance testing via the SHED performance option. However, as shown in figure II-2 in the ISOR the compliance rate for current product certified by performance is lower than the compliance rate for current product certified by design. EMA members do not disagree that some changes to the requirements for all products regardless of certification approach will improve the compliance rate, but clearly requiring performance (SHED) testing to demonstrate compliance is no better than the design based approach.

Changes made to the related test methods for either fuel tank permeation (TP-901) or SHED diurnal testing (TP-902) were not demonstrated by CARB in the rulemaking process and are expected to increase test to test variability, in addition to engine/equipment to engine/equipment variability. In fact, none of the testing completed by CARB Staff in support of the rulemaking was conducted utilizing the test procedures with revisions as proposed. As such many of these changes result in increased standard stringency, increased certification burden, increased

test-to-test variability, and/or increased unit to unit test result variability. For example: (i) TP-901 change to delete language associated with secondary operations results in significant new permeation test requirements; (ii) the apparent inclusion of the fuel tank cap in TP-901; (iii) the elimination of the canister purge prior to diurnal testing in TP-902 at a minimum would increase the variability in the test results given the canister initial test state will be a variable and contradicts currently published CARB position regarding canister requirements (SORE Evaporative Certification FAQ's item 1-38, revised 11-9-2015); and (iv) the change from ROG to TOG compounds being regulated.

As such the proposed changes to the certification requirements are clearly arbitrary.

#### C. Compliance Determinations

The SSI Evaporative Regulation Amendments make changes to the compliance determination process required by the agency to significantly reduce the burden on the agency, but result in significant potential for manufacturers to be deprived of due process associated with that determination. As described in the ISOR CARB Staff expects a significant increase in compliance testing by the agency, with resulting penalties, recall obligations, and future certification testing burden to be borne by the engine/equipment manufacturer. There is no doubt that reducing the agency's testing burden from 5 units to 1 unit will reduce the agency's costs associated with evaluation of products deemed compliant with the SSI evaporative emission regulations. However, such an absolute single failure compliance determination is both precedent setting and blatantly unfair. By comparison the current evaporative compliance requirement is based on a statistical analysis of multiple units tested, similarly for SSI exhaust emission compliance determinations a statistically significant failure from testing multiple units (up to 30) is required prior to making a compliance determination on an average (not individual unit) basis. The process associated with the leap from CARB testing one unit and declaring a failure and the determination those fines, recall, and/or significant increases in certification testing burden for an EO Holder must be defined by the regulation. At a minimum, the information that the Executive Officer must consider before revoking an Executive Order is required. The penalty is also unbalanced as products that are certified under the performance provisions have no increased compliance burden versus non-integrated manufacturers that utilize the design based approach to compliance.

### III. Specific Proposed Regulatory Order Changes Required

A. Specific areas of concern identified by EMA that may require additional interaction with CARB Staff to agree upon regulatory language in the Proposed Regulation Order include the following:

1. Definition of "Evaporative Family" is related to small off-road engines whereas the evaporative regulation is designated as "Off-Road Equipment."

- a. EPA has defined evaporative family 40 CFR Part 1060.230)(a) as: For purposes of certification, divide your product line into families of equipment (or components) that are expected to have similar emission characteristics throughout their useful life.
  - b. Recommend CARB revise the definition to read: “Evaporative Family” means small off-road engines or equipment models in the same engine class that are grouped together....”
2. Definition of a “Fuel Line” is missing. By not including a CARB definition the EPA regulatory definition per 40 CFR Part 1060.801 would apply: “Fuel line means hoses or tubing designed to contain liquid fuel....”.
3. Deleting definition of ROG and inserted the definition of TOG:
  - a. CARB has not reported TOG analysis in any testing performed on engines or equipment related to this rulemaking
  - b. Recommend CARB reinstate the definition of ROG
4. §2753(b) “...expected to exhibit the highest and lowest diurnal emission rates...must also include one of the following for the engine or equipment model in the evaporative family that is expected to exhibit the highest diurnal emission rate....”
  - a. Inclusion of lowest adds significant burden with no benefit
  - b. Recommend CARB revise the requirement to read: “...expected to exhibit the highest ~~and lowest~~ diurnal emission rates...must also include one of the following for the engine or equipment model in the evaporative family that is expected to exhibit the highest diurnal emission rate....”
  - c. Also recommend that CARB add an example of the criteria expected to be provided for each option, for example:
    - i. Diurnal emission test – include the rationale for the highest determination
    - ii. Component emission test results: (a) highest fuel tank permeation rate expected (g/day); (b) highest fuel line permeation rate expected (g/day); and (c) other components not specifically identified
    - iii. EO Numbers – include: (a) highest fuel tank permeation rate expected (g/day); (b) highest fuel line permeation rate expected (g/day); and (c) other components not specifically identified
5. §2753(f) “Beginning in model year 2020, an applicant who has not held an Executive Order of Certification for an evaporative emission control system...”

- a. Requiring diurnal emissions test results for a new applicant who has never received certification before imposes requirements unfairly against new manufacturers.
  - b. Recommend that CARB remove this section to allow new manufacturers the same certification flexibility as established manufacturers.
- 6. §2753(g) “A Holder whose Executive Order has been suspended or revoked...”
  - a. Requiring diurnal emission test results for certification for any EO holder that has any evaporative family suspended is premature and too broad. EO holders may have several evaporative families that are not related to a family with a suspended EO. In addition an EO may be suspended and not determined to be in noncompliance or revoked imposing an unjust burden on the Holder.
  - b. Recommend that CARB revise the requirement to read: “A Holder who’s Executive Order has been ~~suspended~~ or revoked...”
- 7. §2754(a) “...on and after the model years indicated.”
  - a. Given that all model years included in the table are historical the proposed changes are being imposed without lead-time required to implement any changes required including revised requirements specified in sections (b), (c), (d), and (e).
  - b. Recommend that CARB add 2020 model year implementation dates for all three categories specified in Table 1 linked to the revisions being adopted by this rulemaking.
  - c. As stated above the change in certification test fuel results in a significant change in standard stringency. For the 2020 model year additions to the table above the applicable diurnal and permeation standard limit values should be increased 20%.
- 8. §2754(b)(2) “...all fuel lines exposed to liquid fuel or fuel vapor ....” is a significant change to the definition of the regulatory component currently described as a fuel hose (see Table 1). CARB Staff has not conducted any testing that demonstrates the change to include vapor lines. The proposed language appears to change the definition of a fuel line established by U.S. EPA without providing such a CARB specific definition.
  - a. Recommend that CARB establish a CARB specific definition for fuel line if the intention is to include vapor lines.
  - b. Recommend that CARB include the increased cost of changing vapor lines to provide permeation control in the cost benefit analysis for the rulemaking.

- c. Recommend that CARB be required to provide test data demonstrating the emission benefit of using low permeation vapor lines prior to adopting this provision.
- 9. §2754(c) “.... shall also do one of the following:” provides two options identified as (1) and (2) but does not align with the requirements specified in §2753(b) that includes a third option.
  - a. Recommend CARB add an option (3) that reads: “Provide EO Numbers – including fuel tank, fuel line, and carbon canister.”
- 10. §2754.1(b)(5) revised language requires the Holder to certify each model within an evaporative family. As such the requirement eliminates the benefit of grouping models into families whereby the highest emitting model in the family is tested and utilized to represent the family for averaging and banking purposes. Holders forego their ability to generate additional credits from lower emitting products in exchange for reduced certification and testing burden associated with certification of each model.
  - a. Recommend that CARB reinstate the current language associated with the evaporative family and determination of the worst case model.
- 11. §2756 Fuel Cap Performance Standard does not include the change included in proposed revisions to TP-901 associated with fuel tank cap installation and removal. It is unclear if the change is intended to apply to engines or equipment tested per TP-902. It is also unclear if there is a process (as prescribed by EPA) to obtain a component EO for a fuel tank cap or what the applicable standard would be. As proposed the additional requirements for fuel tank caps indirectly prescribed by the changes to TP-901 constitute an underground regulation that is not supported by the rulemaking record.
  - a. Recommend that CARB clarify the fuel tank cap permeation requirements for design certified engines/equipment and what fuel tank cap requirements are for performance certified engines/equipment.
  - b. Recommend that CARB be required to provide test data demonstrating the emission benefit of including the fuel tank cap prior to adopting this provision.
  - c. Recommend that CARB add a model year effective date to the table whereby fuel tank caps must be installed/removed 300 cycles for all small off-road engines/equipment >80 cc using the same rationale as described in §2754(a) above.
  - d. Also recommend that CARB add an option to obtain a component EO for a fuel tank cap to provide alignment with U.S. EPA as specified in 40 CFR §1060.521.

12. §2759(c)(4)(D) adding "... and location (state or country)...." is not appropriate and should not be required.
  - a. Recommend that CARB remove the added location requirement.
  - b. §2759(d) adding "...fuel lines, fuel tanks, and carbon canisters..." to the labeling applicability requirements should be aligned with EPA labeling requirements as specified in 40 CFR §1060.137.
13. §2761(f)(1): "...all of the Holder's evaporative families....." should be clarified as applicable only to engines or equipment and not components that have received an EO.
14. §2761(f): End-of Year and Final Sales Report:

Due to the complex nature of the distribution channel of small-off road power equipment actual product sales is a number that most certificate holders would be unable to obtain. This requirement should be delayed until the updated inventory is completed as part of the CARB 2018 Board Proposal and relevant product distribution information would be available to all certificate holders. At that time CA fraction of total US sales could be applied to provide CARB with reliable estimates of sales on an annual basis.
15. §2765(a)(8): Utilizing a single unit test result to determine an evaporative family has failed to comply is unprecedented in emission regulations and is not support by CARB regulatory history in any other circumstance. For example current Small SI evaporative compliance is based on a statistical calculation of several units with inclusion of a mean value and similarly Small SI engine exhaust emission compliance test procedures as described in Title 13 CCR §2407(c) includes a statistical calculation method known as cum-sum to determine compliance. As such an individual engine tested and found out of compliance cannot be introduced into commerce but the compliance of the family is not determined until sufficient numbers of test results statistically determine the family to be out of compliance.
  - a. Recommend that CARB revise the language to read: "An evaporative family engine or equipment is deemed to have passed the compliance testing if....If any engine or equipment unit has diurnal emission more than five percent above the applicable ....the engine or equipment will be deemed to have failed compliance testing. ...If the diurnal emission from an engine or equipment unit tested.... The evaporative family engine or equipment will be deemed to have failed compliance testing.
  - b. Changes to this section should also identify the steps that the Executive Officer must take prior to making a determination of non-compliance for the applicable evaporative family. For example:



- i. If upon determination that a unit tested by CARB is not compliant the Executive Officer must follow the process identified in §2765(c), including but not limited to the manufacturer providing the Executive Officer test results that demonstrate on average the family is in compliance with the applicable regulations.
  - ii. If upon evaluation by the engine/equipment manufacturer it is determined that the failure was the result of a component certified by CARB that is not compliant with the related component EO, CARB shall hold the engine/equipment manufacturer harmless and consider investigation of the Holder of the component EO.
- 16. §2765(b): “.... The holder of the Executive Order of Certification shall have 30 calendar days .... equipment units selected by the Executive Officer that demonstrate compliance...” imposes an unnecessary constraint of the EO Holder to provide information and the Executive Officer to identify the units to be tested.
  - a. Recommend that CARB remove the new language “units selected by the Executive Officer”.
- 17. §2765(c)(7): Once the Executive Order for a fuel line, carbon canister, or fuel tank have been revoked CARB must notify all engine or equipment manufacturers that have utilized the revoked EO as part of their demonstration of compliance per §2753(b). The notification of the component EO being revoked must include any constraints associated with on-going production, distribution, or sale of engines or equipment that utilize the previously certified component. The constraints placed on on-going production, distribution, or sale must include lead time associated with identification of a certified alternative component, submission of running changes to certification documents, and time to obtain newly required components. Any engines or equipment produced and either sold, or in the distribution system prior to the notification of the component EO being revoked are assumed to be compliant unless an “Ordered Recall” is implemented per §2763 in which case the recall shall be the responsibility of the component EO Holder.
- B. Specific areas of concern identified by EMA that may require additional interaction with CARB Staff to agree upon regulatory language in the proposed revision to CP-902 include the following:
  - 1. Section 4.3 Certification Testing is incomplete. Per section 4.1 the applicant may submit test results or Executive Order numbers for fuel tank, fuel lines, and carbon canister. Fuel line and fuel tank permeation testing is not prescribed by TP-902 but rather TP-901
    - a. EMA recommends the language be revised to read: “...according to TP-902, or fuel line and tank permeation according to TP-901 as applicable with the results submitted to ARB....”

- b. Per above EMA also recommends the option to certify a fuel tank cap as a component.
  - 2. Section 4.4 Data Carryover and Carryacross: The changes to remove the carryacross option should be reversed. Carryacross is a viable option for certification in some circumstances and as currently prescribed by CP-902 ARB has full authority to determine if such carryacross is appropriate.
  - 3. Section 5.3 Emission Label: The requirement to submit an emission control system label at the time of certification is impractical. The certification process must be completed prior to production, therefore having a production label available at the time of the certification application submission is not possible. The stricken language regarding the submission of information for review and ARB's right to request actual labels should be reinstated.
- C. Specific areas of concern identified by EMA that may require additional interaction with CARB Staff to agree upon regulatory language in the proposed revision to TP-901 include the following:
- 1. Section 8.1 Pressure Test: The change to delete the language regarding secondary operations implies that the tank being tested must include any accessory components that may require an opening in the fuel tank. This appears to be a back door approach to requiring that the fuel tank accessories be regulated components through a test procedure, rather than a regulatory requirement. Expansion of the fuel tank being certified to include the fuel tank accessories significantly changes the regulatory requirements for fuel tanks in part because fuel tank testing per TP-901 is a fuel tank material permeation test whereby the tank tested has been determined to have characteristics that make it the highest emission configuration. A fuel tank component EO is currently utilized to represent a large number of different fuel tank configurations including many different fuel tanks that may have various accessories.
  - 2. Section 8.2 Slosh Test: The proposed alignment with the EPA testing provision in 40 CFR part 1060.520(a)(3) should be included as an option not a requirement. ARB has shown no test data to demonstrate that either method provides different test results and the EPA method increases the length of the slosh preconditioning from 6 days to 46 days.
  - 3. Section 10 Sealing Procedure: The change to seal the tank with the fuel tank cap used in the durability demonstration (section 8.4) implies that the fuel tank cap is considered part of the fuel tank being tested. However, nowhere in the proposed regulation is the fuel tank defined as including the fuel tank cap. This appears to be a back door approach to requiring that the fuel tank cap be a regulated component through a test procedure, rather than a regulatory requirement. Expansion of the fuel tank being certified to include the fuel tank cap significantly changes the regulatory requirements for fuel tanks in part because fuel tank testing per TP-901 is a fuel tank material permeation test whereby the tank tested has been determined to have characteristics that make it the highest emission

configuration. A fuel tank component EO is currently utilized to represent a large number of different fuel tank configurations including many different fuel tank cap opening sizes. In addition, the fuel tank EO Holder is very often not the party that provides the fuel tank cap in the final product utilizing the fuel tank. EPA regulations recognize this potential and allow the fuel tank cap to be tested and certified separately per 40 CFR part 1060.103(e). If CARB's intention is to regulate the fuel tank cap, the requirements associated with the tank cap must be described in the regulatory requirements. In the case where the tank cap is to be regulated TP-901 must include information regarding the testing of the fuel tank cap. In addition, the ability to test a fuel tank per TP-901 must not preclude the ability of the fuel tank test results being utilized to certify fuel tanks that utilize a cap that is different than the cap utilized to conduct the tank testing.

D. Specific areas of concern identified by EMA that may require additional interaction with CARB Staff to agree upon regulatory language in the proposed revision to TP-902 include the following:

1. In section 3 the deletion of the purge of the carbon canister is not appropriate. Elimination of the canister purge prior to diurnal testing at a minimum would increase the variability in the test results given the canister initial test state will be a variable. CARB Staff appears to contradict the currently published CARB position regarding canister requirements as described in SORE Evaporative Certification FAQ's item 1-38, revised 11-9-2015. In addition, none of the testing reported by CARB in support of this rulemaking reflects this change to the test procedure.
  - a. Recommend that CARB reinstate the "Purge carbon canister (if so equipped) with 400 bed volumes of nitrogen or dry air at the canister manufacturer's recommended rate" language.
2. Also in section 3 the change from total hydrocarbons to total organic gases is not justified. To the best of our knowledge CARB has not conducted any testing of SSI evaporative systems that could be considered measurement of total organic gases. CARB Testing and the referenced EPA test instrumentation in 40 CFR Part 86.107-96 (b) are described as "evaporative emission hydrocarbon and methanol analyzers." For example, this instrumentation cannot be used to measure common organic gases such as Formaldehyde.
  - a. Recommend that CARB reinstate the current "total hydrocarbons measured" language.
3. In section 4 the change of reference from 40 CFR 86.107-96 to 40 CFR 86.107-98 is not appropriate as -98 is associated with refueling emissions whereas -96 is associated with evaporative emissions.
4. In section 5.1 the change in preconditioning conditions from 30° C ± 10° C to a minimum of 38° C is not justified. As proposed the minimum

temperature for the 140 day minimum preconditioning period is the same as the current accelerated procedure temperature that only required a 30 day, 60 day, or 140 day based on tank wall thickness. EMA recommends that the current standard and alternative conditioning language be retained.

5. In section 6 the inclusion of the option to use EPA test fuel described in 40 CFR Part 1065.710(b) is appreciated but incomplete as there are three fuel options included in the CFR reference. EMA recommends adding language to clarify that "general testing" fuel is being specified.

#### **IV. Conclusion**

EMA appreciates the opportunity to provide these comments. It is very important that significant changes are made to the proposed amendments prior to their adoption. EMA and our member companies will work with CARB Staff to make the required changes through the appropriate regulatory notice and comment process. These changes will provide the improvements in certification procedures, compliance procedures, and updated certification test fuel expected from the SSI Evaporative Regulation Amendments.

Respectfully submitted,

TRUCK AND ENGINE  
MANUFACTURERS ASSOCIATION